

Remarks

Applicants gratefully acknowledge the courtesy extended by Examiner Olsen to Applicants' representatives, Michael A. Makuch and Mary A. Montebello, in a telephonic Examiner Interview held on July 6, 2007.

Claims 1-5 and 7-12 are pending herein. By this Amendment, claims 1 and 7 have been amended, and claims 6 and 13-15 have been canceled.

Claim 1 has been amended in part to include the contents of canceled claims 6 and 14 therein. Claim 7 has been amended in part to include the contents of canceled claims 13 and 15 therein.

Claims 1 and 7 have been further amended to more clearly present the steps of the claimed methods.

Applicants submit that the amendments herein do not raise new issues. Accordingly, Applicants respectfully request entry of this Amendment.

In the Office Action, claims 1-13 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,326,302 to Joubert ("Joubert") in view of U.S. Patent No. 6,869,542 to Desphande ("Desphande") and further in view of U.S. Patent No. 6,069,090 to Eriguchi ("Eriguchi").

In view of the amendments and remarks herein, Applicants respectfully request reconsideration and withdrawal of the rejection set forth in the Office Action.

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Applicants respectfully submit that claims 1-5 and 7-12 would not have been obvious over Joubert in view of Desphande and further in view of Eriguchi.

As noted above, claim 1 has been amended to include the contents of canceled claims 6 and 14, and claim 7 has been amended to include the contents of canceled claims 13 and 15. Thus, both claims 1 and 7 now include the following features:

- (i) the etching method is carried out by a capacitively coupled plasma etching system, which forms a high-frequency electric field between a pair of opposed electrodes disposed in the processing vessel to generate the plasma; and

(ii) the distance between the electrodes is such that a distance between a first of said electrodes and a wafer disposed on a second of said electrodes is from 30 to 90 mm.

As a result of features (i) and (ii) above, a plasma of the etching gas can be securely generated between the two electrodes. Therefore, the CD shift value of etching can be securely and precisely controlled by adjusting a flow ratio of the O₂ gas to the NH₃ gas.

Neither Joubert, Desphande nor Eriguchi teaches features (i) and (ii) above.

According to the Office Action, Joubert teaches the use of conventional etching sources, with specific mention of LAM TCP and Applied Material PDS reactors. The Examiner takes official notice that conventional etching sources, particularly the reactors named in Joubert, have an electrode spacing within the claimed 30-90 mm range.

Joubert teaches the use of an induction coil coupled plasma etching system, wherein plasma is formed by using an induction coil. In such a system, the lower electrode of the system has nothing to do with the formation of the plasma. That is to say, the distance between the upper electrode (the first electrode) and the lower electrode (the second electrode) in the induction coil coupled plasma etching system is not selected based on whether a plasma will be formed.

On the other hand, in Applicants' claimed method, because a plasma is to be formed between the first and second electrodes in a capacitively coupled plasma etching system, the distance between the first electrode and the wafer disposed on the second electrode is an important factor in forming the plasma. In addition, the instant specification teaches at page 20, lines 3-9, that a capacitively coupled plasma etching system is preferred over other etching systems, including inductively-coupled type etching systems, "from a viewpoint of obtaining a higher etching selectivity at a suitable plasma density." Thus, the particular plasma etching system used in Applicants' claimed etching method is a significant feature of the claimed method.

Joubert does not teach or suggest the use of a capacitively coupled plasma etching system, and does not teach or suggest the combination of using a capacitively coupled plasma etching system and a distance between electrodes such that a distance between a first of said electrodes and a wafer disposed on a second of said electrodes is from 30 to 90 mm. Desphande and Eriguchi do not cure these deficiencies.

Thus, for at least this reason, Applicants submit that claims 1-5 and 7-12 would not have been obvious over Joubert in view of Desphande and further in view of Eriguchi.

In view of the amendments and remarks herein, Applicants respectfully request that the rejection set forth in the Office Action be withdrawn and that claims 1-15 be allowed.

If any additional fees are due in connection with the filing of this paper, such as fees under 37 C.F.R. §§1.16 or 1.17, please charge the fees to Deposit Account 02-4300; Order No. 033082M239.

Respectfully submitted,
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MAM/MM/cj

Enclosures: (1) Petition for Extension of Time
(2) Check for the sum of \$450